

Seibert (A)

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of Gastro-Enteritis in
Children.

BY

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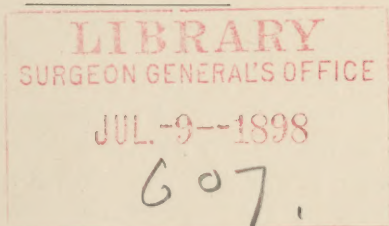
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THE PREVENTION AND TREATMENT OF GASTRO-ENTERITIS IN CHILDREN.*

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THE infectious origin of gastro-enteritis is to-day a recognized fact. Since the first ætiological researches in this direction by A. Baginsky in 1875, Hueppe's *Investigations concerning the Decomposition of Cow's Milk through Micro-organisms* in 1883, Soxhlet's device of a successful method of employing infected cow's milk in artificial infant feeding in a comparatively sterile condition in 1886, the works of Escherich, Booker, and others on the bacteria found in the alimentary canal in this disease—the finding of the actual relation between the weather and gastro-enteritis by Seibert, by comparing the daily meteorological conditions of ten years with the appearance of 8,036 cases in his dispensary class—and at last the discovery of the immigration of enteritic bacteria into the blood, the spleen, the liver, the lung, and the kidneys in most cases made by Czerny and Moser—

* Read before the German Medical Society of the City of New York, January 3, 1898.

have united themselves in forming an unbreakable chain of proofs for this assertion.

Only after the origin of an epidemic or endemic disease has been recognized can its prevention and treatment be intelligently instituted. Gastro-enteritis is no exception to this rule, although the results have not as yet come up to the expectations. Assuming that the modern regulation of infant feeding is well known in this society, I need but ask you, while listening to the following remarks, to remember that all efforts in this direction must strive to come as near to the physiological standard as possible. Among the recent attempts at improving the artificial food of infants we find expression given to views which sadly need close inspection, for the reason that they must necessarily mislead the judgment of the unprejudiced student. While, for instance, the most prominent pædiatrists of this country but ten years ago would not recognize the organic and chemical poisons of dirty milk as the cause of gastro-enteritis, and while, except by A. Jacobi, the boiling of milk was then not even recommended, we find that Crandall, in an editorial on artificial infant feeding in the *Archives of Pædiatrics* of November, 1897, makes the statement that "the methods *adopted* in other countries compared with those *developed* here must be called crude."

If any one looking over the above-mentioned article of Ferdinand Hueppe on Milk Bacteria, in the second volume of the *Publications of the Imperial Health Office in Berlin*, 1884, finds that in his introductory History of Lactic-acid Fermentation ninety-eight scientific researches on this subject are cited, of which not one was conducted outside of Europe, and who furthermore knows that the first sterilizing apparatus for in-

fant feeding (Soxhlet's) was brought home to America by Caillé in the fall of 1887, and that before its arrival the germ invasion of milk and its effects were unknown factors among us here, this editorial announcement that methodical artificial infant feeding was *developed* here and was only *adopted* in other countries will sound queer indeed, even though he had no knowledge of the many other valuable researches of German workers in this field.

The milk laboratories instituted by Rotch (Boston) a few years ago, in which the fat, sugar, solids, and water of cow's milk are separated by machines and then again brought together in percentages ordered by the physician, which Crandall probably had in mind when making the statement quoted, have unquestionably been developed in this country. Possibly they were originally intended for the prevention of gastro-enteritis among the children of the middle and working classes in larger cities, among whom this ailment will exclusively develop epidemically, and possibly these laboratories suffered the fate of the well-known *large hotel* built for a home for working women by the benevolent widow of a millionaire in this city, where each guest would have been obliged to pay from twelve to eighteen dollars a week for her room without meals alone, for the milk laboratory and the working-women's hotel can to-day be made use of by wealthy people only. The infants of wealthy parents do not remain in the city during warm weather, and with this the prophylactic value of these laboratories as institutions for the mass of the people crumbles to a trifling factor, for their product is so expensive that even the middle classes can not afford to use it for their children any length of time. But, in spite of its high price, the

nutrient value of this food appears to me questionable. This modification of cow's milk, to my mind, oversteps the line, for in the subtilty of its composition the product surpasses human milk and the laboratory the breast of the mother. The proportions of fat, casein, albumin, sugar, and water are not alone subject to daily but even hourly changes in mother's milk. This change may be of as important value to the infant as the change of diet to the adult. Cow's milk, modified by approximate dilution, changes at least from day to day, and no doubt but that no two bottles contain, for instance, the same amount of fat. In laboratory milk all the constituents remain the same from one feeding to another, from day to day, from week to week, until the supervising physician sees fit to write another prescription. We find the same fault in all commercial infant foods, and for this reason the milk laboratory appears to me a forward step in the wrong direction. Such infant feeding is certainly not "crude"; on the contrary, it is even more than artificial—it is artistic.

Furthermore, Crandall states that "the first and most important attempt to secure certified milk was made by Dr. Coit in Newark." Dr. Coit began his work in 1893. As a commentary on this statement I have here a circular which I will pass around for inspection, which was given to me in the Certified Dairy in Frankfurt on the Main, Germany, in August, 1886. This establishment has been under the supervision of the local medical society since 1877, and this circular is dated April, 1881. Among the names signed to this paper we also find that of H. Rehn, one of the best pædiatrists of our time. We further notice that unfermented and unadulterated cow's milk is here pronounced the best substi-

tute for human milk; that only healthy Swiss Rigi cows are used, fed on dry fodder consisting of imported Alpine hay, bran, wheat flour, and pure water only; that the floors of the stables are cemented throughout; that the stables have high ceilings, accessible to sunlight and constantly ventilated by special contrivances; that the cows are washed off twice daily; that the dairy utensils are cleaned with special care, and that all of the milk is bottled in half, one, and two-litre glass jars and delivered in the houses within four hours after the milking; and, at last, that the boiling and keeping cool of the milk are urgently recommended in large type for infant feeding.

This medical dairy in Frankfort, in which no physician is financially interested, celebrated its twentieth birthday in April last, and similar milk institutions have been in existence in most of the larger cities of Germany and Austria (Leipsic, Stuttgart, Vienna, Berlin, etc.). for fifteen years.

Dr. Coit, in Newark, certainly deserves much credit for the good work he has accomplished, but certainly not that it should be diminished in the eyes of well-informed men through the paraded elementary ignorance of overzealous admirers regarding municipal hygiene in Europe.

The distribution *en masse* of pasteurized milk for nominal prices, under the supervision of Freeman, in New York, and Getty, in Yonkers, to the most ignorant mothers in these cities, are well-meant experiments, but to my mind overstep the line in the direction opposite to that of the laboratories, by the low price charged for the milk. Such inadequately disguised and sterilized milk beggaries, no doubt, are of temporary service, but

certainly would develop into nuisances as permanent institutions. A poor and ignorant mother who can daily receive prepared food for her offspring for the asking, will never learn the "why" for milk cleansing, and thus, instead of arousing a diligent zeal for properly feeding her baby, such paternalism but fosters thoughtless indolence. Twenty years of continuous service in the children's department of the German Dispensary, and thousands of visits made during fifteen years in the homes of the poorest of the poor as physician to the charitable German Society (No. 13 Broadway), have taught me that educating the poor to the necessities of cleanliness is alone of permanent value, while continuous almsgiving simply promotes beggarmdom. The attempts of Freeman and Getty to explain the decrease in the mortality of gastro-enteritis during the last few years exclusively by the milk distributions mentioned appear to me rather risky, because (1) no controlling records were kept concerning the progress of the respective infants, and (2) because these authors leave aside the fact that the sterilization of milk in the house and the knowledge of proper infant feeding have during the last ten years become more and more popular among the middle and working classes, and that the modern treatment of these disturbances in the dispensaries and clinics, of New York at least, has certainly aided in reducing these mortality figures.

Pasteurization of milk will never become an important factor in the prevention of gastro-enteritis, nor do its apostles appear to expect this, for Freeman openly confesses (*loc. cit.*) that "the pathogenic bacteria most feared in milk are those of typhoid, diphtheria, and tuberculosis, which would surely be killed by pasteuriza-

tion." Well, Mr. President, this can also be accomplished by simply bringing milk to the boiling point! Why, then, this subtilty? The mothers of tenement-house infants will never learn to pasteurize, while the most ignorant of them can readily be taught to sterilize milk in a pot, as devised by Langermann.

As to my own experience, I must confess that sterilization is good enough for me. Wherever it fails, it is not the fault of the long boiling, but the pathological condition of the child's digestive organs, which must be removed by the physician before any milk, boiled, sterilized, or pasteurized, can be properly digested. To dabble with the milk in such cases is dodging the issue; it is the child that needs treatment and not the sterilizing apparatus.

To even enumerate the most important possibilities of infection of the infantile alimentary canal would be impossible. I prefer to confine my remarks to a source which for years past has supplied me with the most obstinate cases of this infantile ailment—namely, the early mouth infection of the newborn.

As soon as the funis is ligated and the obstetrician is convinced of the contractility of the maternal uterus, the physician's index finger enters the oral cavity of the baby to remove whatever of vaginal mucus it may there find. The maternal vagina has been explored only after careful disinfection, for he considers puerperal fever avoidable; but the baby's mouth is to him but the first accessible cavity where he may again exercise his heretofore restricted digit by vigorous movements, regardless of the vaginal and faecal bacteria that may adhere to it. The nurse adds to this oral infection after bathing the child, and then dust-laden sugar water, stale fennel

tea, sugar-filled linen nipples, impure rhubarb syrup, and, lastly, uncleaned breast-nipples invade the mouth of the innocent one in succession, and their bacteria invade the stomach, the intestine, the bile duct, and the blood. Icterus neonatorum, dyspepsia, colic, mucous fæces, long screaming, loss in weight, and often intense gastro-enteritis are the results of such modern midwifery, which so far carefully guarded the mother but not her child. Yet the accoucheur does not alone deliver the mother of her child, but also the child of its surrounding mother, and to my mind the infant has the same claim upon his care, for not alone the mother's but also the baby's life is at stake.

To prevent gastro-enteric infection of the newborn is easily accomplished. The physician's finger can be cleaned before entering the baby's mouth as well as before entering the maternal vagina during labor. Midwives, fennel tea, sugar nipples, cathartics, and filthy breast nipples can be dispensed with, and a modern confinement ought to be looked upon as successful not only after the mother's genital organs, but also the baby's eyes, navel, and alimentary canal have escaped pathogenic infection.

The treatment of gastro-enteritis in children is one of the most important duties of the general practitioner. In New York more cases of this ailment are seen during the summer months by medical men than of all other diseases combined. In spite of this fact I have found that its treatment varies so very much among physicians that an unbiased observer might conclude that the origination of gastro-enteritis was to-day as obscure as twenty years ago. Yet there does not exist another pathological condition, aside from bacillary diphtheria,

which will yield so readily to early rational treatment as acute gastro-enteritis, and there is not a task imposed upon the physician so ideally satisfactory in its surmounting as the successful treatment of as yet curable cases of chronic gastro-enteritis.

“The first imperative indication in all cases is to remove all remnants of food, bacteria, and ptomaines from the stomach and intestine.” These words I used in summing up a paper on this subject in July of 1889 (*Med. Monatsschrift*, page 357). Since that time the best pædiatrists of all countries have time and again called attention to this necessity, and yet we find that maltreatment of enteritic infants with opium, limewater, and bismuth mixtures is exceedingly popular among physicians in general, although such remedies are really here as much indicated as cathartics in appendicitis, and they will most probably be used until some day this or that medical brother has been punished for malpractice.

In the severest forms of acute milk poisoning, called cholera infantum, energetic stomach washing must be performed immediately. The prompt use of Epstein's method, which I introduced into this country ten years ago, has saved many lives. My former assertion that “the deeper the collapse the sooner and more thoroughly should the stomach be washed” has been completely verified as correct (*Archives of Pædiatrics*, April, 1889). Plain warm water should alone be used. All medicinal additions may do harm.

Below the pylorus the possibility of washing the bowel ceases down to the Bauhinian valve. Therefore the physician should immediately begin at the lower end and wash out the colon with large quantities of water, while the calomel powders he has prescribed to excite en-

ergetic peristalsis and excessive transudation of serum in the small intestine are being prepared in the drug store. Colon washing can then be repeated twice daily by the mother, as long tubes are not necessary, provided the child's buttocks are well elevated. If the intestine is parietic, massage is of great benefit.

If hyperpyrexia is present, the water used for stomach and bowel irrigation should be cool, and even cold. Reduction of temperature will result much more speedily by a cool continuous colon irrigation lasting ten minutes than by a cold bath of the same duration. After excessive losses of fluid by copious stools it is wise to leave appropriate quantities of water in the stomach and the colon. Alcoholic stimulation I only make use of hypodermically in deep collapse. Administered by the mouth, alcohol may do more harm than good, by increasing the irritation of the gastric mucosa. When the collapse has disappeared, because the amount of the absorbed poison was insufficient to destroy life, it usually suffices to restrict the diet of the child to water and gruel, without milk, for the next three days, for the alimentary canal to recover its equilibrium again.

As a counterpart to these cases, which most probably are chiefly caused by bacillary invasion and toxalbuminoid poisoning (*vide* Booker, *loc. cit.*), appear those presenting continuous high fever, muco-purulent and bloody stools, and tenesmus, and where streptococci predominate among the faecal bacteria. Nausea is usually absent, so that lavage can be dispensed with, but good doses of calomel and irrigations of the colon are absolutely necessary until the last particle of mucus has disappeared from the stools. If the faeces contain blood, the rectal injection of a fifth-of-one-per-cent. to

a one-per-cent. solution of nitrate of silver (at least ten ounces) after each colon washing is indicated. Where the rectal discharges are more of a muco-purulent character, a five-per-cent. solution of ichthyol, given like the nitrate of silver, has served me well. Internally, calomel to begin with; later on, salol to combat the odor, and still later tannigen (Escherich) until all mucus has disappeared.

The second chief indication in the modern treatment of gastro-enteritis is the absolute prohibition of milk, human and animal, as a food during the first three days of illness. We can not remove the pathogenic bacteria from the alimentary canal in a few hours, occasionally not even in three days. If we therefore feed the remaining germs too soon with milk they will, of course, multiply rapidly again and will form toxines which, in company with the germ invasion of the whole body, will but add to its destruction instead of to its nourishment. Even the most ideal breast milk ought to be kept out of an infected intestine until the dangerous mass-meeting of bacteria has been dispersed, for even mother's milk is no antiseptic, but will here but serve as a good culture medium for the causes of the trouble. Under-feeding of the child with water, gruels, and strained soups can do no harm here, while milk, even in very small quantities, can but aid the infection but not the nourishment of the body.

This second fundamental principle of modern therapy in gastro-enteritis appears to be even less popular among the profession than the first. Some believe that sterile milk will remain sterile even in the filthiest alimentary canal, and others are in fear of causing collapse in the child by the sudden withdrawal of milk. Both

views are pædiatric antiquities which, alas! have not yet been gathered in, numbered, and nailed to the wall of the historical museum for therapeutical theories, and so removed from the possibility of evil-doing. For the healthy infant sterile milk is the best food, for the gastro-enteritic baby it is the worst.

But when can we safely begin to return to feeding milk to the convalescent child? In acute cases among breast-fed babies I have followed the rule to begin with the breast and a weak sterilized mixture of cream and gruel (one to ten) as soon as the first normal stool has appeared, and if all goes well, to gradually come back to the normal diet within a week, so as to give the weakened digestive organs ample time to gradually become accustomed to their work. In artificially fed infants the strength of the cream mixture is gradually increased and occasionally it is given alternately with soups and broths until the fæces appear normal again.

Among the chronic cases of this disease the secondary changes in the lung, the liver, the spleen, and the kidneys now and then make it difficult by their prominence to discover the enteric source of infection. In the presence of general amyloid degeneration the prognosis is very grave, yet not always hopeless. Again, where the little patients are suffering from marasmus and have shriveled down to living mummies with senile faces after months of gastro-enteritic poisoning, rational treatment is occasionally rewarded by success, although in these cases the intestinal wall appears to suffer most through germ invasion and atrophy. These patients are usually bottle fed. After having thoroughly emptied the alimentary canal, and regular colon irrigations have been instituted until health returns, it has served me well to

feed such infants on soups and water for one or even two weeks. Rice, oatmeal, and barley soup cooked with lean meat (beef, veal, mutton, and chicken) and fresh, unsalted butter, with the yolk of a fresh egg added occasionally, and soup of dried whole peas (without egg) once daily, alternately given in appropriate quantities and at proper intervals of two to three hours, until all odor and mucus disappear from the fæces, surpass all factory products in these cases by far. At night only filtered water is given. Salol is given thirty minutes before a meal, three times daily. If odor and mucus are absent from the stools, a weak cream mixture is substituted twice daily, and retained permanently, unless the fæces again become fermented. Anorexia and a furred tongue call for hydrochloric acid before each meal, and in hyperacidity nitrate of silver before and bicarbonate of sodium after each feeding have given me good results. Within the last few months I have occasionally made use of ichthyol in streptococcus enteritis. Mr. L. Weiss, who superintends the prescription department of Eimer & Amend, has been kind enough to experiment with this drug until he found a palatable mixture for infants' use: Ichthyol, 1.5 grammes; glycerin, four grammes; elix. e. succ. liquir., 24.0 grammes; aquæ destill. ad 60.0 grammes. Three to six times daily one teaspoonful. Together with five-per-cent. solutions used for colon washing this drug will be of use in destroying the vitality of the streptococci in appropriate cases. In mixed infections it will assist; in the bacillary cases (of the choleraic type) it is useless.

You will admit, Mr. President, that my stock of drugs for use in gastro-enteritis is very small; yet I would not do without those I have mentioned, for I have

found them of value if appropriately given together with the above-mentioned dietetic and mechanical treatment of this ailment. No doubt some gastro-enteritic cases will always end fatally in spite of all care, but to my mind many children die in New York every year that ought to have been saved in view of our present knowledge. As soon as the general practitioner wakes up to the fact that the smallest gastro-enteritic baby intrusted to his treatment has the same claim upon his thoughtfulness as his most prominent patient suffering perchance at the same time from pneumonia and fatty heart, then, no doubt, will the mortality among young city children begin to decrease visibly. To incite to this has been my object to-night.

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